Report to the Origins Subcommittee

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Washington, D.C
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Astronomy/Physics Division

- Missions Updates
- Strategic Planning Update
- Explorer/Discovery
- ROSS-02 Results

Astronomical Search for Origins Mission Status

	Launch	STATUS	Comments
HST	**Feb '02**	GRN	SM4 slip to Feb 05, funding an issue;
JWST	**June '09**	GRN	TRW selected as prime contractor; Mission replan underway
			Name changed to JWST
SIRTF	**01/03/02**	YEL	Launch delayed until April 15 due to launch pad congestion and range repairs
			.
SOFIA	**Dec '04**	GRN	Telecope Assembly delivered to Waco; Structural modifications to the plane
			are completed. First test flights in about 12 months
SIM	**Dec '09**	GRN	Technology Milestones have been met. SIM on track to enter Phase B in mid
			2003
TPF	**NET 2014**	GRN	Sci Wrk Grp Selected, Technology Roadmap submitted; Science Roadmap
			being developed; Phase 2 technology studies from NRA selected; LOA with ESA signed
Keck Int.	**2003**	YEL	No major change since Jun report. Still no permits for Outriggers
			Lawsuits continue
KEPLER	**2007**	GRN	Grnd System and Sci Wrk Grp initial meeting held
		GRN	Proceeding on Plan, only normal, minor problems
		YEL	Significant Problems or Concerns but feasible plan to resolve
		RED	Major Problems; Solution path unclear
		*	As shown in the FY02 President's Budget Request

Astronomical Search for Origins Mission Status

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Navigator	10/01/01	GRN	No Major Issues
MSC	Jun'03	GRN	Name changed to Michelson Science Center; Archiving Keck Single Aperture Data
			Core Functionality PMSR in March 03
LBTI	Jun ' 06	GRN	Proceeding on schedule in Phase C/D; Phase E details under discussion
2MASS	Jan '98	GRN	Observations Completed; Final year of funding for Analysis
FUSE	June '00	GRN	FUSE is working well with increased sky coverage: Selection of Guest
			Investigators of next round in Dec 02.
		GRN	Proceeding on Plan, only normal, minor problems
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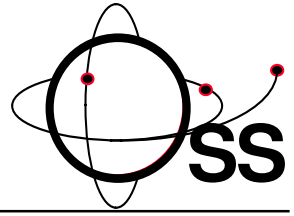
Astronomical Search for Origins Mission Status

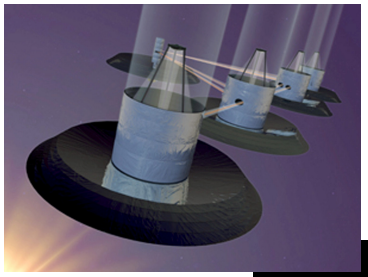


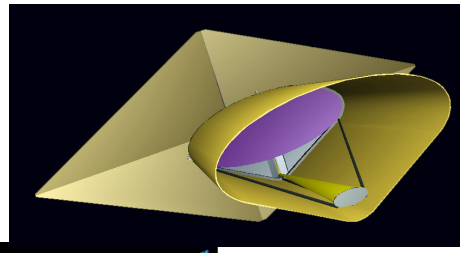
- GP-B continues to be a drain on APD resources
  - Launch slip to late July very likely
- CHIPS will be launched on or about Dec 19
- GALEX will be launched probably in March 03.

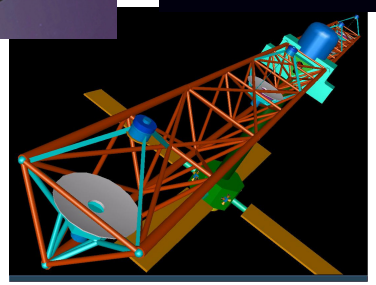
HST Cycle 11 Review

- HST TAC Review Committee report delivered
  - Membership: Alan Dressler,Juri Toomre, Sandy Faber,Piet van der Kruit, Steve Strom, Jaqueline Bergeron, Harvey Tananbaum
  - Results are generally positive
  - A few areas need attention like better feedback to proposers.
  - The System seems to be working

Terrestrial Planet Finder







What?

- mid-IR nulling Interferometer (structurally connected or formation flying type) or visible-NIR Coronagraph
- Starlight suppression to 10^{-6} (mid-IR) or 10^{-9} (vis-nir)
- Launch Vehicle: EELV class
- L2 or Earth-trailing solar orbit
- 5 year mission life with 10 year goal
- Potential collaboration with European Space Agency DARWIN Mission

Why?

- Survey a statistically significant number of solar type stars for Earth-mass planets by suppressing the light of the parent star and looking for the faint reflected vis-nir light or the thermal emission in the mid-ir from planets in the “habitable zone”
- Make low resolution spectral observations of the brightest planets looking for evidence of a *habitable* planet using signatures such as O_2, CO_2 and H_2O.
- Make very sensitive, low resolution spectral observations the most interesting planets, looking for signposts of a planet inhabited by primitive life forms using potential biomarkers such as oxygen, ozone, or methane.
- Use TPF’s combination of sensitivity and spatial resolution to carry out a program of general astrophysics.

When?

Phase A in ≈2007; Phase B in ≈2009/10; Phase C/D in ≈2012; Launch in ≈2015

TPF Activities and Plans

- Four industry/university teams completed studies of alternatives to the TPF baseline formation flying interferometer concept
- OSS directed JPL to terminate the flight aspects of the StarLight Project,
- Six Technology/Flight projects selected from Extra-Solar Planets NRA-- recently five were selected to continue.
- New TPF Science Working Group selected by Headquarters--
  - Twenty member plus ESA representation
  - Membership will evolve
  - Second meeting next week.

TPF Activities and Plans

- TPF project has developed technology roadmap that has been review by the Navigator program Independent Review Team.
  - Presentation to Code S EPMC on Thursday
- TPF Project will develop a science roadmap with the following objectives:
  - Determine what science questions must be answered before a TPF architecture can be selected.
  - Determing what science questions must be answered before TPF can fly
  - Determine when this must be known, and
  - How to acquire the knowledge.

TPF Precursor Science

- Two elements to the precursor science program
  - Origins of Solar Systems funds from the R&A program
  - TPF Funds for “Science Roadmap”
- R&A funds are $2.5M this year and will rise to $3.4M next years.
  - This is probably too fast!
- TPF funds are scheduled to be 10% of Technology funds
  - About $1M/year for Michelson Studentships and Fellowships
  - Remaining funds for precursor science.
- ROSS-03 will consolodate TPF & R&A funds

Strategic Planning

- Origins 2003 Roadmap Completed
- Input to OSS Strategic Plan well received at Code S Strategic planning meeting
  - Both Origins and SEU presented viable well thought out roadmaps
- Code S Strategic Plan due to SSAC in late Jan 03
  - Internal working Group is hard at work.
- Marc Allen will provide further details tomorrow

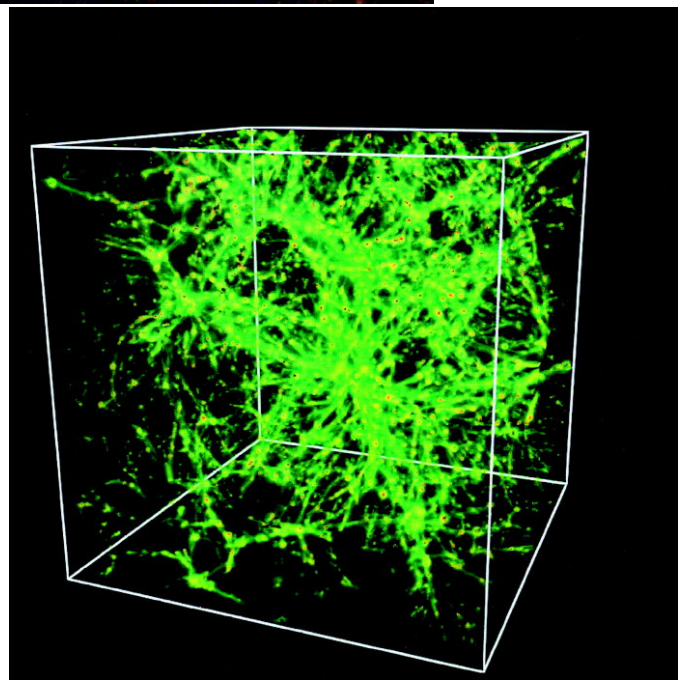
Astronomy/Physics Division

- Astronomy and Physics Working Group (APWG)
  - Second Meeting held in October 2002
  - Report by Doug Richstone
- Science Archives Working Group (SAWG)
  - First Meeting held in November 2002
  - Report by Bill Oegerle
- People: Hashima Hasan, IPAs Guenter Riegler

Explorers Update

- MIDEX Phase B selections are in progress(early CY2003).
- AstroBiology Explorer(ABE)= Origins Mission.
  - Scott Sanford from AMES is the PI
  - 60 cm cyrogenic spectroscopic mission.
  - Essentially does R~3000 science in the 2-20 micron region that SIRTF does not!
- NGSS(Next Generation Sky Surveyor)
  - Ned Wright UCLA is the PI
  - Precursor Science for JWST
- SPIDR selected for flight 2005.
  - SPIDR primary goal is to map the Cosmic Web.
  - SPIDR PI is Supriya Chakrabarti, Boston University.

PI: Supriya Chakrabarti/Boston University
PM: Boston University
S/C: Draper
Major Partners: MIT, SpectrumAstro



- Measure and map the hot (10^5 – 10^6) gas found in the intergalactic medium where the hidden baryonic matter is believed to be.
- Test cosmic theories of the formation and evolution of the universe
- Test of major predictions of cosmological hydrodynamic simulations of the formation of both large-scale structure and individual galaxies
- Solve the mystery of the "missing" baryons predicted by standard models of Big Bang nucleosynthesis
- Determine the amount and physical properties of the hot plasma out to z ~ 0.17 (750 Mpc)

Explorer Update

SMEX 10/11

- Draft AO released on August 12 for comment
- AO release currently targeted for February 2003
  - Depends on Explorer budget
  - Selection for Phase A: approx October 2003
  - Downselection for Phase B: approx August 2004
  - Launch dates: February 2007, February 2008

http://explorer.larc.nasa.gov/explorer/smexacq.html

Explorer Update

SMEX 10/11

- SMEX cost cap: $100M (FY03)
- Full TMC evaluation
- Changes
  - No Shuttle launch except to ISS
  - NASA project must be managed by GSFC or JPL
  - Proposer's checklist
  - GSFC engineering services in Stage 1
- ISS policies still in flux
  - Especially cost and schedule

EXPLORERS UPDATE

Select ~4 for Phase A, downselect to ~2 for flight
Science themes: SEC, ASO (including astrobiology), SEU (including fundamental physics)
Complete Missions
- ELV free flyer
- ISS attached
- No Shuttle launch offered for free flyer

Cost Cap: $100M (FY03)
- Includes ELV and NIAT increases
- Contributions limit: 33% of cost to OSS

Outside the Cap: Phase F
- Extended mission MO&DA
- Guest Investigator Program
- Archival data Analysis Program

EXPLORERS UPDATE

GSFC services offered

- Stage 1: 40 hours of engineering
- Stage 2/Phase A: project management or support
- Focused services: S/C acquisition, ISS carrier, etc.

Evaluation Criteria:

- Science Merit
- Scientific Implementation Merit (formerly technical merit and feasibility of science implementation)
- Technical, Management, and Cost Feasibility, including Cost Risk (formerly mission implementation approach including cost risk)
- E/PO, Technology, SDB deferred to Phase A
  - E/PO commitment and outline required

Phase A Concept Study

- Five months
- $450K

Cost Growth

- 20% reserves required at confirmation

EXPLORERS UPDATE

- Participation in non-OSS space program
  - Classic
  - International Space Station
  - Long Duration Balloon mission
- Select zero or more for Phase A
  - Select for flight after $250K funded concept study
- Cost Cap: $35M (FY03)
  - Also offer Phase F enhancement
- Commitment date:
  - NASA commitment required NLT 31 December 2005
  - No launch date requirement

UV/IR Ross 02 Results

- 37 of 99 proposals were selected for funding.
  - 16 were renewals
  - 2 were close-outs.
  - 19 were truly new.
- A total of 99 grants will be funded in FY03 including 2nd and 3rd years grants.
- Issue: UV rockets reaching the end of useful science capabilities.